VIGNAN'S NIRULA
INSTITUTE OF TECHNOLOGY & SCIENCE FOR WOMEN
(Approved by AICTE, New Delhi & Affiliated to JNTU Kakinada)
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Department of Information Technology

Innovative Teaching Practices

Faculty Name : Mrs.Sasikala, Mrs.Dhrakshayani
Course Name : Statistics with R Programming
Class : II B.Tech II Semester
Academic Year : 2021-2022
Title of the Topic : Control Statements
Activity Name : Flipped Classrooms

Objective of the Activity:

The objective of this Flipped Classroom activity is to provide students with the opportunity to learn and apply control statements (like `if`, `else`, `for`, `while`, and `switch`) in R programming. This activity follows the flipped classroom model, where students are introduced to concepts through pre-class materials (such as videos or readings) and then apply these concepts during in-class activities. The goal is to foster critical thinking, problem-solving, and collaboration among students as they explore how control statements can be used to manipulate program flow in R.

Activity Procedure:

1. Preparation:

Pre-Class Learning Materials:

- Provide students with pre-class materials (e.g., video tutorials, reading materials, or online resources) explaining the different control statements in R programming.
- The materials should cover the following:
  - Conditional statements: if, else, ifelse(), switch()
  - Looping statements: for, while
  - Break and next statements in loops
- Include examples of how these control statements can be used in different scenarios, such as decision-making processes, repeating tasks, or handling multiple conditions.

Classroom Setup:

- Prepare problem sets that require the use of various control statements to solve problems.
- Prepare a worksheet for each student to document their work and thoughts during the activity.

2. Phase 1 – Think (5-7 minutes):

- **Individual Work:**
    - Students will individually work on the provided problems from the worksheet. The problems will require the students to:
        - Write code using conditional and looping statements in R.
        - Solve basic tasks such as calculating the factorial of a number using a loop, checking whether a number is even or odd, or finding the largest number in a list using ifelse().
    - Students should focus on:
        - Writing and testing the code individually.
        - Reflecting on the syntax and purpose of each control statement used.

3. Phase 2 – Pair (10-15 minutes):

- **Partner Discussion:**
    - Students will pair up to compare their individual solutions. They will discuss:
        - The different approaches they used to solve the same problems.
        - Whether any other control statements could have been used to achieve the same outcome.
        - How certain control statements made the code more efficient or easier to understand.
    - In pairs, students will work together to:
        - Debug any errors in their code.
        - Refine their use of control statements for more optimized solutions.
    - Each pair will answer the following guiding questions:
        - How do different control statements affect the flow of a program?
        - In what scenarios would one control statement (e.g., ifelse()) be preferred over another (e.g., if-else)?
        - How does the use of loops improve efficiency when performing repetitive tasks?

4. Phase 3 – Share (10-12 minutes):

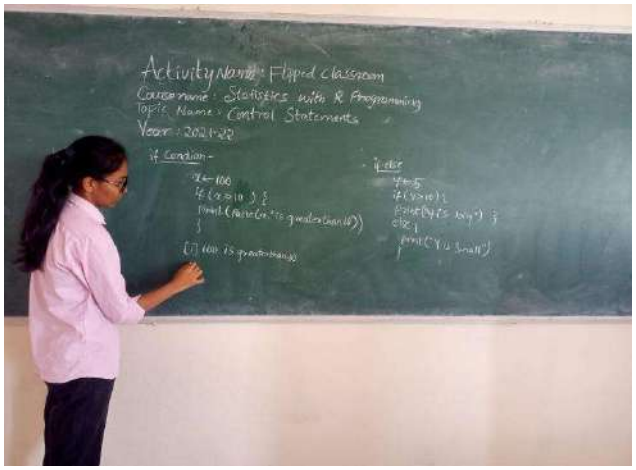
- **Class Presentation:**
    - Each pair will present their findings to the class:
        - The problems they worked on and the control statements they used.
        - Their solutions and how they applied each control statement in their code.
        - The challenges they faced during the activity and how they overcame them.

- The instructor will facilitate a class-wide discussion comparing the different approaches, encouraging students to learn from each other and highlighting best practices for using control statements in R.

Wrap-Up (5 minutes):

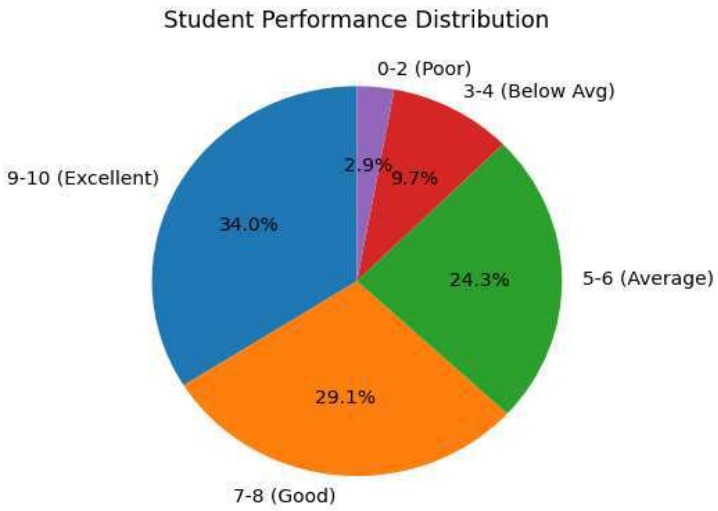
- **Reflection:**
    - Students will reflect on their individual and group work by answering the following questions:
        - What was the most challenging aspect of using control statements in R programming?
        - How did the use of different control statements help simplify complex tasks?
    - The instructor will summarize the activity by emphasizing the importance of control flow in programming and its real-world applications, such as automating repetitive tasks, managing decision-making processes, and optimizing program efficiency.

Screenshot of the Practice



Assessment Analysis

Marks Range	Number of Students	Percentage
9-10 (Excellent)	35	34.0%
7-8 (Good)	30	29.1%
5-6 (Average)	25	24.3%
3-4 (Below Avg)	10	9.7%
0-2 (Poor)	3	2.9%
Total	103	100%



Conclusion of Flipped Classroom Activity:

The flipped classroom activity successfully allowed students to understand and apply control statements in R programming. By reviewing the pre-class materials, engaging in individual problem-solving, collaborating with peers, and presenting their solutions, students enhanced their skills in controlling program flow. The activity not only helped students master control statements but also fostered deeper engagement and collaborative learning. Through peer discussions and class presentations, students developed problem-solving skills that are critical for writing efficient, maintainable code in R.

Signature of the Faculty **Head of the Department**